

Small Hive Beetle (*Aethina tumida*)

The small hive beetle, *Aethina tumida* Murray, is native to sub-Saharan Africa where it is an occasional pest in colonies of African subspecies of the western honey bee (Hymenoptera: Apidae, *Apis mellifera* Linnaeus). However, the beetle has been found outside of its native range where it can cause considerable damage to colonies of European subspecies of honey bees. Because of its rapid spread, the small hive beetle is studied increasingly, both for its economic importance and biological significance.



Small hive beetles were confirmed in the southeastern United States in 1998 in a commercial apiary in Florida, but previously unidentified specimens indicate its presence in the U.S. since at least 1996. The small hive beetle initially appeared in port cities such as Charleston, South Carolina and Savannah, Georgia as well as parts of Florida, and since has spread to much of the U.S.

There is a noticeable increase in hive beetles in the hive during the summer months usually after the Cantaloupe crop is ending. With a lot of rotten fruit on the ground the beetles have a haven. When that runs out they migrate to our hives.

Hive Beetle:

White egg masses deposited by the adult female into crevices within the hive. Larvae tunnel through the combs, killing brood and ruining newly drawn comb.

Cream-colored larvae feed on pollen and honey for 10-16 days before exiting the hive to pupate in the soil around the hive.

Pupae are light tan to blueish tan in color.

Winged adults emerge from the soil in 2-3 weeks, re-enter the hive to feed and reproduce.

Life span is up to 6 months.



Upon locating and entering the host colony, adult small hive beetles seek out cracks and crevices where they hide from bee aggression. These locations are often referred to as 'prisons' (Ellis 2005). Remarkably, honey bees station guards around the prisons where small hive beetles hide. The 'prison guard' bees keep the small hive beetles confined to the cracks and out of the brood combs where there is an ample supply of honey, pollen, and brood on which small hive beetles reproduce. Small hive beetles do not starve in these prisons as they are able to solicit food from their bee captors. In this behavior, small hive beetles use their antennae to rub the bees' mandibles and induce the bees to regurgitate. Small hive beetles then feed on the regurgitated food (Ellis 2005, Ellis and Hepburn 2006).

The female hive beetle will lay a cluster of eggs in cracks or any place that is hard for the bees to access.

The female has a ovapositor with which she lays eggs. She can maneuver it into different positions.

The female can enter an empty cell and chew through the cell wall and lay eggs within the cell with a larvae. She can chew a small hole in the capping of a brood cell and lay eggs within the cell. The eggs do not bother the larvae they just use the cell after the larvae hatches.

Hive Beetle Larvae destroying a honey frame. They excrete Bacteria that causes the honey to ferment and ruin. This can happen in your honey frames if you leave them stored for a long period of time not extracted.



Opportunistic feeders

They will eat rotten fruit but much more desire a beehive.

Things that attract Hive Beetles

1. Fear Pheromone given off by the bees sometimes when the hive is worked. The smell is similar to the smell of bananas.
2. Wax and bur comb debris left on the yard. Poor hive hygiene. Clean out debris collected on the bottom board where larva can pupate.
3. Wooden ware in ill-repair, a lot of holes and gaps for hive beetles to enter the hive.
4. Queenless hives which are dwindling in population.
5. Heavy varroa mite infestation weakening the bees making them vulnerable.
6. Hives with a buildup of Nosema Cerana also weakening the hive population.

What can we do to lessen the likelihood of rampant beetle infestation?

Basics:

1. Good hive hygiene.
2. Routine mite sugar shakes and proper mite treatments.
3. Test for Nosema and treat accordingly.
4. Replace or repair equipment damaged or rotten.
5. Replace a queen as soon as possible and add a frame of brood or two from much stronger hives.
6. Use Hygienic queens who's workers run the beetles to the top of the hive and imprison them with Poropolis.
7. Remove all Dead Out equipment immediately for the bee yard and if possible freeze the frames for 48 hours before using them again.

Equipment used to lessen the population of beetles to a manageable level.

1. Freeman Beetle trap bottom board filled with oil or West Beetle trap which fits between the hive body and bottom board by means of a shim also filled with oil.
2. Beetle Baffle between bottom board and hive body.
3. Beetle traps within the hive. Beetle Jail, AJ's Beetle eater, Beetle Barn, Beetle swatter, Beetle Blaster, Corrugated Beetle trap.
4. Diatomaceous Earth spread around the hives on the ground.
5. Move hives to a new location or at least 100 feet away to lessen pupa activity. They can still fly.
6. Blunt end of a hive tool.

Approved Chemical means.

1. Gardstar ground soak.
2. Check Mite Strips.

Biological means



Photo by Ganpati Jagdale

Heterorhabditis indica Nematodes

Is a heat tolerant nematode that works better against many insect pests when the temperature is between 25°C and 29°C. This nematode has great potential to use as a biological control agent to manage fungus gnats and other greenhouse pests in the US greenhouse industry.



Steinernema carpocapsae Nematodes

This nematode is an "ambush forager", which means it uses the sit-and-wait strategy by standing on its tail in an upright position to attack highly mobile insects

- Why you need them

- they are natural parasites of insect pests so they do not pollute or harm the environment
- they can kill their hosts rapidly within 24-28 hours after infection
- they have a broad range of insect hosts
- able to search for insect hosts actively, infect and kill them
- nematodes can easily reproduce inside the dead insect body and emerge as infective juvenile that start looking for new hosts to continue the life cycle in the soil after first application
- they can be easily applied using traditional insecticide spraying equipment

- [Why they are safer than traditional pesticides](#)

- they do not damage plants
- can be used and applied around children and pets
- do not cause any harm to the personnel involved in their production and application
- food products are safe to handle and eat when they are treated with nematodes
- they do not harm humans, animals, beneficial insects (ie. honey bees), microbial communities and other beneficial nematodes

Nematodes working a larvae.



The hive beetles are small and multiply quickly and can lead to the destruction of a hive. If a colony gets overly stressed by the beetles they will abscond leaving the destruction behind.

Hive beetles can hide in a swarm and take up residence in the new colony location. The bees may out fly the beetles and locate further away than the beetles can fly. The bees may be free for a while but the beetles given the right opportunity will infest another hive and make it their new home.

Usually the absconded bee will not have supplies enough to start over and usually this happens during a dearth and the bees die.

Most of this information came from
Dr. Jamie Ellis University of Florida.

www.UFhoneybee.com

Thank you for your interest and attention.

THE END